

REMARKS

Claims 1-7 are pending in this application.

Claim 1 has been amended to positively recite that a "food additive slurry" is produced.

Likewise, claim 4 has been amended to consistent therewith.

Claims 4 and 5 have been amended to positively recite method steps, i.e., grinding, wet grinding, etc.

Claim 6 has been amended to include the term "comprising:" after "composition,".

Claim 7 has been amended to correct a minor error, i.e., the term "composition" has been replaced with the term "slurry" in view of the fact that claims 1-5 are directed to a "food additive slurry."

Support for the claims as amended, appears throughout the specification and claims as originally filed. No new matter has been added.

In view of the following remarks, further and favorable consideration, is respectfully requested.

- I. At page 2 of the Office Action, claim 1-5 and 7, have been rejected under 35 USC § 103(a) as being unpatentable over Buddemeyer '376 in view of Buddemeyer '996 and Sawhill '622.***

The Examiner states that it would have been obvious to the skilled artisan to use alkali metal at the end of the process (Sawhill) with the other ingredients (Buddemeyer) because the other

claimed ingredients have been shown and the alkali metal serves to solidify the mixture. An analysis of each of the applied references is set forth below.

A. The Applied References:

Buddemeyer '376: Buddemeyer '376 teaches a composition that is a stable colloidal suspension containing phosphate ions, citrate ions, calcium ions, metal hydroxides and water, where the composition has a high solids content of which 70 wt% of the available calcium is dispersed. Buddemeyer '376 teaches at *col. 2, lines 1-5*, that the *order of mixing* the various ingredients in forming the composition is *critical* and results in a dramatically increased solids content of soluble calcium in the composition, as compared to the solids content achieved using prior art methods.

Buddemeyer '376 *requires*, at *col. 2, lines 55-67*, and *col. 3, lines 1-14*, forming a *precursor mixture* of the citrate source, the calcium source, the metal hydroxide and water where preferably the calcium source is added to the water first, followed by the addition of the metal hydroxide to form a mixture, where the citrate ion source is added to that resulting mixture, to form the resultant precursor mixture. The phosphate ion source is then added to the precursor mixture.

Buddemeyer '376 teaches at *col. 3, lines 6-14*, that:

“It has been discovered that *adding the source of phosphate ions to the formed precursor mixture...dramatically increases the level of soluble solids in the composition making these high solids contents obtainable*. This improvement substantially lessens the quantity of moisture in the composition that must be shipped...therefore, will lessen the cost...” (emphasis added)

In view of the foregoing quote, Buddemeyer '376 does *not* teach or suggest adding an alkali metal salt at the end of the process, as presently required.

Buddemeyer '996: Buddemeyer '996 is directed to a mineral enrichment polymeric composition having a high molecular weight, preferably greater than 300,000, which is formed by admixing a cation source (*i.e.*, calcium, etc.) an alkali metal phosphate source, and an organic acid having at least three carboxyl groups, where the resultant mixture is heated for a period of time sufficient to polymerize the admixture.

Buddemeyer '996 teaches, at col. 4, lines 54-63, that preferably the cation source is added to water first and mixed, followed by the addition of the alkali metal phosphate source with mixing, and *lastly* the organic acid is added and is mixed. Buddemeyer '996 does *not* teach or suggest adding an alkali metal salt at the end of the process, as presently required.

Sawhill: Sawhill is directed to methods for producing animal feed supplements formed as solid gels, where protein-rich by-products and lactose-rich by-products are first treated, and then are concentrated to a solids content in excess of 50 wt%. Thereafter the by-products are treated with gelation agents for example phosphoric acid and lime, to form a liquid gel, and lastly magnesium oxide is added to solidify the by-product liquid gel. thereby forming the solid animal feed supplement.

Sawhill teaches that prior art solid feed supplements formulated with lime and phosphoric acid at an acid pH are soft blocks and thus *insufficient* because soft blocks are over consumed by animals. Sawhill states that blocks that are sufficiently hard limit the blocks consumption.

Sawhill teaches at col. 2, lines 35-47, that the invention overcomes prior art problems by providing a sufficiently hard and water resistant solid block, where the solidification is achieved by the addition of calcium oxide or hydroxide and phosphoric acid, and magnesium oxide.

Applicant's note that "magnesium oxide" is *not* an alkali metal salt. Alkali metals are set forth in Group I A of the periodic table, and include lithium, sodium, potassium, rubidium, cesium, and francium. Rather, "magnesium oxide" is an alkaline earth metal compound. Alkaline earth metals are set forth in Group II A of the periodic table, and include calcium, strontium, magnesium and barium.

B. Applicable Authority:

(i) Motivation to combine references:

MPEP 2143 discusses the requirements of a *prima facie* case of obviousness. First there must be some suggestion or motivation to combine the reference teachings or to modify the reference, and second there must be a reasonable expectation of success. Finally, the prior art reference or references when properly combined, must teach or suggest all the claim limitations.

MPEP 2143.01 states that there are three possible sources for a motivation to combine references: the nature of the problem being solved, the teachings of the prior art, and the knowledge

of one of ordinary skill in the art. Further, MPEP 2145 (X)(D)(2) states that “It is improper to combine references where the references *teach away* from their combination.”

This section quotes *In re Grasselli*, 713 F.2d 731 (Fed. Cir. 1983) which court held that a claimed catalyst which contained both iron and an alkali metal was not suggested by the combination of a reference which taught the interchangeability of antimony and alkali metal with the same beneficial result, combined with a reference expressly excluding antimony from , and adding iron to, a catalyst.

A combination of references may teach every element of a claimed invention, but without a motivation to combine the references, a rejection based on a *prima facie* case of obvious was held improper. *In re Rouffet*, 149 F.3d 1350 (Fed. Cir. 1998).

(ii) Motivation to modify properly combined references:

Further, where the prior art conflicts, all teachings must be considered. The fact that references can be combined or modified is not sufficient to establish *prima facie* obviousness. MPEP 2143.

MPEP 2143 states that there must be some suggestion or motivation to modify the references, and there must be a reasonable expectation of success. Finally, the prior art reference or references when properly combined, must teach or suggest all the claim limitations.

MPEP 2143.01 states that a proposed modification cannot render the prior art unsatisfactory for its intended purpose. If it does, then there is no suggestion or motivation to make the proposed

modification. Further, the proposed modification cannot change the principle operation of a reference.

Regarding combining references, the court in *In re Oetiker*, 977 F.2d 1443 (Fed. Cir. 1992), held that "There must be some reason, suggestion, or motivation found in the prior art whereby a person of ordinary skill in the field of the invention would make the combination. That knowledge can not come from the applicant's invention itself." The court in *In re Paulsen*, 30 F.3d 1475 (Fed. Cir. 1994), held "in reviewing the Board's obviousness conclusions, we have been guided by the well-settled principles that the claimed invention must be considered as a whole, multiple cited prior art references must suggest the desirability of being combined, and the references must be viewed without the benefit of hindsight afforded by the disclosure."

The court in *In re Rouffet*, 149 F.3d 1350 (Fed. Cir. 1998), held that "...this court requires the examiner to show a motivation to combine the references that create the case of obviousness...there must be some teaching, suggestion, or motivation to combine the references....three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art."

The court in *Winner International Royalty Corp. v. Wang*, 202 F.3d 1340 (Fed. Cir. 2000), held that if a prior art reference "did in fact teach away from [a second reference], then that finding alone can defeat [an] obviousness claim" based on combination of the two references. In *Karsten*

Manufacturing Corp. v. Cleveland Golf Co., 242 F.3d 1376 (Fed. Cir. 2001), the court held that “the conflicting teachings of two prior art references can not reasonably be viewed as suggesting their combination...”

(iii) Teaching away:

MPEP 2141.02 states that prior art must be considered in its entirety, including disclosures that *teach away* from the claims. See also MPEP 2145 (X)(D).

The court in *In re Gurley*, 27 F.3d 551 (Fed. Cir. 1994) held that “A prior art reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.” The court in *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443 (Fed. Cir. 1986), held that “A reference should be considered as a whole, and portions arguing against or teaching away from the claimed invention must be considered.”

(iv) Obvious to try:

Obvious to try is not the proper standard for patentability. The court in *In re Lilly & Co.*, 902 F.2d 943 (Fed. Cir. 1990), held that an “obvious-to-try” situation exists when a general disclosure may pique the scientist’s curiosity, such that further investigation might be done as a result of the

disclosure, but the disclosure itself does not contain a sufficient teaching of how to obtain the desired result, or that the claimed result would be obtained if certain directions were pursued."

The court in *In re O'Farrell*, 853 F.2d 894 (Fed. Cir.1988), held that the admonition that obvious-to-try is not the standard under section 103 has been directed at two kinds of errors, (i) where the prior art gave either no indication of which parameters were critical or no direction as to which of many possible choices is likely to be successful, and (ii) where the prior art gave only general guidance as to the particular form of the claimed invention or how to achieve it, that is what was obvious-to-try was to explore a new technology or general approach that seemed to be a promising field of experimentation. See also MPEP 2145 XB.

C. The present invention:

The present invention provides a food additive slurry or powder composition which exhibits excellent dispersibility, dispersion stability in a liquid, and flavor, and in slurry form has low viscosity and good handling characteristics.

Present claim 1 requires forming a precursor of water, a polyvalent metal compound (i.e., calcium) and an organic acid having a carboxyl group; and there after adding to the thus formed precursor, a phosphoric acid source and an alkali metal salt.

D. In View of the Following, this Rejection is Traversed:

(i) No motivation to combine:

It is submitted that a proper case of *prima facie* obviousness has *not* been established. Specifically, the combination of the applied references is improper because there is no motivation, incentive or suggestion supporting the combination.

The skilled artisan in view of Buddemeyer '996 directed to a water-dispersible, solid, polymeric compositions would have no motivation to look to art directed to colloidal suspensions. Likewise, the skilled artisan in view of Buddemeyer '376 directed to colloidal suspensions, would have no motivation to look to art requiring the formation of a solid, polymer composition.

Further, it is submitted that the combination of the '996 and/or 376 with Sawhill is improper because Sawhill is directed to a water-resistant, solid animal feed supplement including protein and carbohydrate and optionally minerals, fats, and fiber, where the supplement is not added to other animal feed, but is provided to the animal in solid form so that the animal can ingest the supplement at will.

Thus, the skilled artisan in view of either or both of Buddemeyer '996 and '376, would have no motivation to look to art directed to a solid animal feed supplements where the supplement is not added to an animal food product and where the supplement is water resistant and hard, because both Buddemeyer '996 and '376 require that the mineral, calcium for example, remain dispersed when added to a food product.

In support thereof, Applicant's note that Sawhill is concerned with problems including sufficient hardness and water resistance, palatability and preventing over consumption, while Buddemeyer '996 is concerned with providing an odorless, colorless, tasteless, polymeric composition for addition to a food product for human as opposed to animal consumption, or for addition to soil, where the amount of the polymeric supplement added to the food product is controlled, and where the polymeric composition is sufficiently dispersible when added to aqueous foods (i.e., milk) where taste of the food product is not adversely affected.

Buddemeyer '376 is concerned with calcium enriched substantially uniform colloidal suspension compositions that contain a high amount of solids and include a high percentage of available calcium ions, where the calcium remains dispersed in the composition, and where the composition is used to increase the calcium content of a food product without negatively affecting the taste, color, or smell of the product. Buddemeyer '376 is concerned with overcoming the prior art problems of insufficient solids contents, prevention of calcium precipitation, and insufficient stability under extreme conditions.

Again, MPEP 2145 (X)(D)(2) states that "It is improper to combine references where the references *teach away* from their combination." In the present case, Buddemeyer '376 *requires* a colloidal suspension. Accordingly, Buddemeyer '376 *teaches away* from any other form, i.e., the solid, water-dispersible, polymeric composition of Buddemeyer '996, or the solid, water-resistant block of Sawhill.

The accepted standard for determining if a reference “teaches away” is found in *In re Gurley*,
supra, and is:

“A prior art reference may be said to teach away when a person of ordinary skill, upon reading the reference, *would be discouraged from following the path set out in the reference*, or would be led in a direction divergent from the path that was taken by the applicant.” (emphasis added)

In the present case, the skilled artisan in view of Buddemeyer ‘376, would be discouraged from investigating a solid form, i.e., the polymeric solid of Buddemeyer ‘996 and the solid, water-resistant block of Sawhill, because Buddemeyer ‘376 *clearly requires a colloidal suspension*. Thus, Buddemeyer ‘376 *teaches away* from both of Buddemeyer ‘996 and Sawhill.

Likewise, Buddemeyer ‘996 *requires* a polymeric, water-dispersible, solid. Accordingly, the skilled artisan in view of Buddemeyer ‘996, would be discouraged from investigating a colloidal suspension or a water-resistant solid block solid form, i.e., the colloidal suspension of Buddemeyer ‘376 and the solid, water-resistant block of Sawhill, because Buddemeyer ‘996 *clearly requires a water-dispersible, polymeric solid*. Thus, Buddemeyer ‘996 *teaches away* from both of Buddemeyer ‘376 and Sawhill.

Further, Sawhill *requires* a water-resistant, solid block, for animals to have access to at will. Accordingly, the skilled artisan in view of Sawhill, would be discouraged from investigating a colloidal suspension or a water-dispersible, polymeric solid, i.e., the colloidal suspension of Buddemeyer ‘376 and the water-dispersible, polymer solid of Buddemeyer ‘996, because Sawhill, *clearly requires a water-resistant, solid block*.

In view of the above and MPEP 2145 (X)(D)(2) which states that “It is improper to combine references where the references *teach away* from their combination”, it is submitted that the combination of Buddemeyer ‘376, Buddemeyer ‘996 and Sawhill, is improper because the applied references *teach away* from each other.

(ii) No motivation to modify:

Assuming *arguendo* the combination proper, none of the references provide any motivation to modify the disclosed methods and compositions, because Buddemeyer ‘376 teaches, at col. 2, lines 1-5, that the order of mixing the ingredients in the method is *critical* to forming the colloidal suspension composition having an increased solids content.

In support of the foregoing, Buddemeyer ‘376 states at col. 3, lines 6-11: “It has been discovered that adding the source of phosphate ions to the formed precursor mixture (i.e., after the source of citrate ions has been mixed with the other ingredients) dramatically increases the level of soluble solids in the composition, making these high solids contents obtainable.”

Thus, Buddemeyer ‘376 *teaches away* from any variation which would change the order of mixing, i.e., Buddemeyer ‘376 *teaches away* from adding an alkali metal salt at the end of process. Please see *In re Gurley*, supra., and MPEP 2143. Buddemeyer ‘376 clearly *requires* that a metal ion source such as an alkali metal hydroxide, only be included in the preparation of the initial precursor composition.

Further, because Buddemeyer '376 teaches that the *mixing order is critical*, the skilled artisan in view of Buddemeyer '376 or '996 would have *no motivation to modify* the mixing order.

Buddemeyer '996 *requires* a polymeric composition having a high molecular weight, preferably greater than 300,000, which is formed by admixing a cation source, an alkali metal phosphate source, and an organic acid having at least three carboxyl groups.

Thus, in view of the above, neither of Buddemeyer '376 or '996, provide any motivation or suggestion, to modify Buddemeyer '376 to include the addition of an alkaline earth metal compound at the end of the process as taught by Sawhill to solidify the mixture (please see the Examiner's comments at pages 2 and 3 of the Office Action). Again, Sawhill does not teach or suggest adding an alkali metal salt at the end of the process, as presently required. Magnesium is not an alkali metal. Rather, it is an alkaline earth metal, as listed in Group II A of the periodic table.

In addition, Sawhill teaches that magnesium oxide is added to impart sufficient hardness to the formulation. Thus, the skilled artisan would have no motivation to modify the colloidal suspension of Buddemeyer '376 by adding the magnesium oxide at the end of the process, as taught by Sawhill, because Sawhill teaches that the magnesium oxide solidifies and imparts hardness while Buddemeyer '376 requires a colloidal suspension.

Further, it is submitted that assuming *arguendo* motivation to modify '376 by including an alkaline earth metal compound (Sawhill) at the end of the process, Buddemeyer '376 would be rendered unsatisfactory for its intended purpose, and it's principle operation would be changed, because Buddemeyer '376 teaches that the mixing order is *critical* in order to achieve the desired

dramatically increased solids content of soluble calcium, and *requires* producing a stable, colloidal suspension, while Sawhill teaches that the addition of magnesium oxide solidifies the mixture.

Accordingly, such a modification would change the principal operation of Buddemeyer '376 because a solid, not the required colloidal suspension, would be produced. Further, because a colloidal suspension would not be produced, Buddemeyer '376 would be rendered unsatisfactory for its intended use, (i.e., the colloidal suspension containing dispersed calcium and having a dramatically increased solids content of soluble calcium due to the critical mixing order, provides an increased amount of calcium when added to a food product where '376 requires that the calcium remains dispersed in the food product) because the form produced by such modification would be a solid, which would result in the calcium not being dispersed in the food product, as required.

Also, because Buddemeyer '376 teaches that mixing order is *critical* to achieving the desired solids content and that the prior art mixing order results in insufficient solids content, the modification to mixing order alone renders Buddemeyer '376 unsatisfactory for its intended use (i.e., the provision of an increased amount of calcium), and changes '376's principal operation (i.e., efficiently providing an increased amount of available calcium in a liquid form which can easily be mixed with a food product such as milk) because only a limited amount of calcium could be added.

In view of the above and MPEP 2143.01 which states that a proposed modification cannot render the prior art unsatisfactory for its intended purpose and/or the proposed modification cannot change the principle operation of a reference, if it does, then there is *no* suggestion or motivation to

make the proposed modification, it is submitted that there is no suggestion or motivation to make the proposed modification.

(iii) Assuming *Arguendo* Motivation to Modify, the Present Method is Not Suggested by the Combination:

Neither of Buddemeyer '376 or '996 teach or suggest adding an alkali metal salt at the end of the process. Sawhill does not cure the deficiencies of Buddemeyer '376 and/or '996, because Sawhill also does not teach or suggest adding an alkali metal salt at the end of the process.

As discussed above, Sawhill does not teach or suggest adding an alkali metal salt at the end of the process. Rather, Sawhill teaches adding magnesium oxide which is an alkaline earth metal compound. Alkaline earth metals are set forth in Group II A of the periodic table. Please see the above discussion and Sawhill, claim 1, and col. 7, lines 32-45.

Accordingly, none of the applied references, taken alone or together, render the claimed invention obvious within the meaning of 35 USC § 103. Thus, the Examiner is respectfully requested to withdraw this rejection.

(iv) Response to the Examiner's specific points:

The Examiner states that Buddemeyer '376 discloses that phosphate ion sources other than acids can be used. '376 teaches at col. 2, lines 6-15, that "The preferred sources of phosphate ions are phosphoric and polyphosphoric acids." The Examples teach the use of phosphoric acid and

polyphosphoric acid, *only*. *No other phosphate ion sources are taught or suggested* by '376. '376 requires adding the source of phosphate ions to a precursor mixture including water, a source of citrate and calcium ions, and a metal hydroxide.

Accordingly, Buddemeyer '376, does not teach or suggest a phosphate source other than phosphoric or polyphosphoric acid.

The Examiner states that Buddemeyer '996 disclose that a calcium compound can be made by adding a source of alkali metal phosphate to water, and a cation source and adding the acid last. Present claim 1 requires forming a precursor of water, a polyvalent metal compound (i.e., calcium) and an organic acid having a carboxyl group; and thereafter adding to the thus formed precursor, a phosphoric acid source and an alkali metal.

'996 *requires* in claim 10, the preparation of an admixture including a cation source, an alkali metal phosphate source and an organic acid. Col. 4, lines 54-63, of Buddemeyer '996, state that it is preferred to add the cation source to water first, followed by the addition of the alkali metal phosphate source, and *finally* the addition of the organic acid, preferably citric acid.

Accordingly, Buddemeyer '996 does not teach or suggest adding an alkali metal salt at the end of the process, as presently required.

The Examiner states that Sawhill discloses adding an alkali metal salt at the end of the process to solidify the mixture. Sawhill discloses the addition of magnesium oxide at the end of the process, to solidify the mixture. *Magnesium is not an alkali metal*. Alkali metals are metals in

Group 1A of the Periodic Table and include lithium, sodium, potassium, rubidium, cesium, and francium.

Accordingly, Sawhill does not teach or suggest adding an alkali metal salt at the end of the process, as presently required.

The Examiner states at page 3 of the Office Action, regarding claim 2, that: "Nothing is seen at this time that there is a patentable distinction in the products made in the order of addition of the chemicals, therefor, it would have been obvious to add the various chemicals at the best times to achieve the required product." Claim 2 is a *method* claim, *not* a product claim. Claim 2 is dependent on independent method claim 1. MPEP 2106 (II) C, states: "...should begin claim analysis by identifying and evaluating each claim limitation. For processes, the claim limitations will define steps or acts to be performed..." It is submitted that the product produced by the presently claimed method, is not determinative of the patentability of the *method* claim.

Further, it is submitted that the Examiner's conclusion of obviousness is based on improper hindsight reasoning. The Examiner takes the position that in view of the present product produced and the Examiner's belief that the present product is "not patentably distinct", it would have been obvious to optimize process steps to produce the present product.

(v). *The Present Examples:*

Assuming *arguendo* a *prima facie* case of obviousness has been established, the present Examples illustrate the unexpectedly superior performance and properties of the present compositions as compared to the compositions of Buddemeyer '996.

Japanese Unexamined patent publication No. Sho 55-84327, which corresponds to Buddemeyer '996, is described at page 4, line 8 from the bottom bridging over to page 5, line 16, of the present specification.

As stated, the mineral-enrichment composition obtained by the described addition sequence is insufficient in the theoretical effective utilization rate of minerals. Further, milk containing the mineral-enrichment composition is not only poor in the yield of calcium compounds in centrifugal classifiers such as a clarifier, but the composition sediments when added to food products such as milk.

Specifically, Comparative Examples 1 and 2, described in the present specification, correspond to the mineral-enrichment composition disclosed by Buddemeyer '996. As shown in Table 1, the weight-average diameters in particle size distribution are 1.45 μm (Comparative Example 1) and 1.05 μm (Comparative Example 2), respectively, which are approximately 10 times greater than those of Examples 1 to 17 of the present invention. Moreover, the solid contents are 11.0% (Comparative Example 1) and 12.5% (Comparative Example 2), respectively, which are approximately half of the solids contents achieved by the present invention, as described in Examples 1 to 17 of the present invention.

Accordingly, as noted in the Comparative Examples, in Table 6, interfacial height and amount of precipitate are both poor, as shown by Comparative Examples 25 (using the composition of Comparative Example 1) and comparative Example 26 (using the composition of Comparative Example 2) in Table 8, the mineral-enriched milks are inferior in the amount of precipitate and in flavor, and as shown by Comparative Example 49 (using the composition of Comparative Example 1) in Table 9, the mineral-enriched yogurt is inferior in amount of the precipitate and in flavor.

Further, Buddemeyer et al. '376 discloses at column 3, lines 6 to 14:

It has been discovered that adding the source of phosphate ions to the formed precursor mixture (i.e., after the source of citrate ions has been mixed with the other ingredients) dramatically increases the level of soluble solids in the composition, making these high solids contents obtainable. This improvement substantially lessens the quantity of moisture in the composition that must be shipped and stored and, therefore, will lessen the cost of shipping and storing the compositions. (Emphasis added.)

In view of the above remarks, it is submitted that the combination of references is improper, that assuming *arguendo* the combination proper, there is no motivation to modify '376, and that assuming *arguendo* motivation to modify, there is nothing in any of the applied references, taken alone or together, that render the claimed invention obvious within the meaning of 35 USC § 103. Accordingly, the Examiner is respectfully requested to withdraw this rejection.

II. At page 4 of the Office Action, the Examiner indicates that claim 6 is allowable if rewritten in independent form.

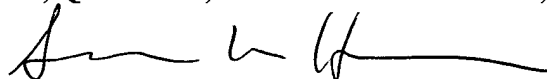
The Examiner is thanked for indicating claim 6 allowable.

In view of the above remarks, it is submitted that the claims are in condition for immediate allowance. Early notice to that effect is earnestly solicited.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,
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